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EXAMINER	
COOLEY, CHARLES E	

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,537	HAVERLAND, HARTMUT	
	Examiner	Art Unit	
	Charles E. Cooley	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-32 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-32 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 July 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

NON-FINAL OFFICE ACTION

1. This application has been assigned to Technology Center 1700, Art Unit 1723 and the following will apply for this application:

Please direct all written correspondence with the correct application serial number for this application to Art Unit 1723.

Telephone inquiries regarding this application should be directed to the Electronic Business Center (EBC) at http://www.uspto.gov/ebc/index.html or 1-866-217-9197 or to the Examiner at (571) 272-1139. All official facsimiles should be transmitted to (703) 872-9306.

2. As the PTO continues to move towards a fully electronic environment, the office will phase-in its E-Patent Reference program. This program: (1) provides downloading capability of the U.S. patents and U.S. patent application publications cited in Office actions via the E-Patent Reference feature of the Office's PAIR system; and (2) ceases mailing paper copies of U.S. patents and U.S. patent application publications with office actions except for citations made during the international stage of an international application under PCT.

Effective June 2004, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions from this Technology Center. Paper copies of foreign patents and non-patent literature will continue to be included with office actions.

The U.S. patents and patent application publications cited in office actions are available for download via the Office's PAIR system. As an alternate source, all U.S.

patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Inquiries about the use of the Office's PAIR system should be referred to the Electronic Business Center (EBC) at http://www.uspto.gov/ebc/index.html or 1-866-217-9197.

Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. § 119, which papers have been placed of record in the file.

Drawings

4. The drawings are objected to under 37 CFR § 1.83(a) since the drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the features canceled from the claims. No new matter should be entered.

a. the mixing means recited throughout the claims.

b. the mixing means with oblique surfaces (claim 19).

c. the mixing means with shovels (claims 20,23).

d. the mixing means with a spiral (claim 21).

e. the subject matter of claim 30.

f. the subject matter of claim 31.

g. the subject matter of claim 32.

5. Applicant should verify that (1) all reference characters in the drawings are described in the detailed description portion of the specification and (2) all reference characters mentioned in the specification are included in the appropriate drawing Figure(s) as required by 37 CFR 1.84(p)(5).

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" (37 CFR 1.121(d)) and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheets must be clearly labeled as "Annotated Marked-up Drawings" and accompany the replacement sheets.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Specification

6. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

7. The disclosure is objected to because of the following informalities:

a. the references to the features of particular claims throughout the specification are improper (e.g., see page 5, first and second paragraphs) because the specification should positively recite the features of the claims rather than inferentially referring to subject matter of a particular claim through incorporation by reference thereto.

b. Page 13, line 18: element 9 refers to the plate rather than the reinforcement ring.

c. The specification should have the following headings inserted therein at the appropriate locations in accordance with 37 CFR 1.77:

Arrangement of the Specification

The following order or arrangement is preferred in framing the specification and, except for the title of the invention, each of the lettered items should be preceded by the headings indicated below.

(a) Title of the Invention.

(b) Cross-References to Related Applications (if any).
(c) Statement as to rights to inventions made under Federally-sponsored research and development (if any).
(d) Background of the invention.
1. Field of the Invention.
2. Description of the Related Art including information disclosed under 37 C.F.R. §§ 1.97-1.99.
(e) Summary of the Invention.
(f) Brief Description of the Drawing.
(g) Description of the Preferred Embodiment(s).
(h) Claim(s).
(I) Abstract of the Disclosure.

Appropriate correction is required.

8. The Abstract of the Disclosure is objected to because:

a. the abstract is not a single paragraph.

b. the inclusion of legal phraseology such as "means" and "said" in the abstract is improper.

A proper abstract on a separate sheet is required.

9. The title is acceptable.

Claim Objections

10. Claim 1 is objected to because in line 2, replace "/" with a comma.

Claim 6 is objected because in line 2, replace "re" with --are--.

Correction is required.

Claim Rejections - 35 U.S.C. § 112, second paragraph

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 6, 8, 10, 11, 13, 14, 15, 16, 25, 26, 27, 28, 29, 30, 31, and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In view of the improper dependency of many of the dependent claims:

Claim 6: "the reinforcement rings" lack antecedent basis.

Claim 8: "the access opening" lacks antecedent basis.

Claims 10 and 11: "the flat plate" lacks antecedent basis.

Claims 13 and 14: "the lower opening" lacks antecedent basis.

Claims 15 and 16: "the opening" lacks antecedent basis.

Claims 25-28: "the end walls" lack antecedent basis.

Claims 29-32: "end wall" lacks antecedent basis.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1, 2, 17, 18, 19, 21, 22, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Boltner-Brand et al. (US 6,179,462).

The patent to Boltner-Brand et al. discloses the recited mixing device in Figs. 1-3 namely a horizontal drum 12; conveying mixing means 6 capable of moving material in the drum in the recited manners; spindle 5 coaxial to the drum; flat plate 29 with pipes 14, 30; elongated lower opening 18 sealed by plate 16; the opening 18 being of smaller dimension than the diameter of the drum; the size of the opening being variable by virtue of the position of the plate 16; and end walls 11.

More particularly, the patent to Boltner-Brand et al. discloses in FIG. 1 an end wall 11 view of a mixer 10. The end wall 11 connects to a mixing drum 12. An additional end wall limits the drum 12 in the axial direction. A bearing 13 is disposed in the end wall 11 for a mixing shaft 5 upon which mixing tools 6 are disposed. The mixing shaft 5 extends through the entire mixing drum 12 and is borne for rotation at each of its ends in an end wall 11. A product supply chute 14 is disposed on the mixing drum 12 to introduce solids and liquids to be mixed into a mixing region 15. The mixing region 15 is defined by the mixing drum 12 and the end walls 11. A door 16 is provided for in a floor region of the mixing drum 12 which extends along the entire axial length of the mixing

region 15. The door 16 is borne on the mixer 10 for rotation via a shaft 17. A first edge 18 and a second edge 19 border an opening 20 which is formed in the floor region of the mixing drum 12. The peripheral second edge 19 borders the door 16, and the peripheral first edge 18 borders the opening 20 on the mixing drum 12 and on the end walls 11. A seal is provided for on the first edge 18 which is attached to a metal band 22. The metal band 22 is firmly connected to the first edge 18. The metal band 22 is stiffened by means of a brace 23. A stiffening angle 24 is provided on the mixer 10 which stiffens the mixer 10 in the vicinity of the bearing for the door 16. The end walls 11 extend into a support structure 25 with which the mixer 10 can seat on a floor. A cutting head 26 is also flanged onto the mixing drum 12 which projects into the mixing region 15 with rapidly rotating blades.

The rapidly rotating blades of the cutting head 26 can support the mixing process within the mixing region 15. The door 16 is shown in the figure in a closed state using dashed lines. The second edge 19 seats in a sealing fashion on the first edge 18 of the opening 20, and the seal 21 is disposed between the first edge 18 and the second edge 19. Dotted dashed lines indicate the door 16 in the opened state.

FIG. 2 shows only individual portions of the mixer 10 in a perspective view. The door 16 is shown displaced relative to the mixing region 15. The mixing region 15 is bordered from above by a plate 29 on which the product supply chute 14 and a vent chute 30 are disposed. In order to better illustrate the features important to the invention, only one end wall 11 is shown in the figure. The mixing drum 12 is defined at each end by an end wall 11 in which the mixing shaft 5 is borne. The mixing drum 12

ends in the lower region in a peripheral first edge 18 which surrounds the opening 20 and lies in a plane. The seal 21 extends within the metal band 22 adjacent to the first edge 18. The seal 21 travels within the metal band 22 and in the end walls 11 in a horizontal plane. The seal 21 is introduced into the end surface of a rounded section 31 in the vicinity of the end wall 11.

The door 16 has a bulge 32 adapted to the mixing region 15. When the door 16 is adapted to the mixing drum 12, an inner surface 33 of the mixing drum 12 maps smoothly into an inner surface 34 of the door 16 when the door 16 is closed. A brace 23 is provided for on the metal band 22 for stiffening purposes. The metal band 22, as shown in the figure, is connected to a support structure 25. A blower device 27 is fashioned in the vicinity of the first edge 18. The blower device 27 provides pressurized air to automatically clean the first 18 and second 19 edges before the door 16 is closed.

FIG. 2a shows a detailed view in the vicinity of the end wall 11 in accordance with view IIa of FIG. 2. The end wall 11 is formed from the rounded member 31 and the wall 35. The rounded member 31 ends in an end surface forming the first edge 18. The seal 21 is disposed in the first edge 18. The seal 18 is shown slightly separated from the second edge 19. The door 16 is pressed with the second edge 19 firmly onto the seal 21 and the first edge 18 to seal the mixing region 15 in a dust-tight fashion. The bulge 32 thereby smoothly borders the mixing region 15.

FIG. 2b shows a detail of FIG. 2 in accordance with the view in arrow direction IIb. The inner surface 33 of the cylinder wall ends in the first edge 18. The metal band 22 likewise borders the first edge 18. A groove is formed in the metal band 22 in which

the seal 21 extends. The metal band 22 is supported via the brace 23 relative to the mixing drum 12.

FIG. 3 shows a view in arrow direction III of FIG. 2. The opening 20 is bordered in a plane by the endless peripheral seal 21 accommodated in the metal band 22 and in the end surfaces of the rounded member 31. The end walls 11 are each formed by the rounded member 31 and the wall 35.

A device for the production of solid mixtures comprises a mixing drum 12 having an opening 20. The opening 20 is bordered by a first edge 18 which lies in a plane. A seal 21 is disposed in the vicinity of the first edge 18 which likewise extends in a plane and which surrounds the opening 20 both in the vicinity of the mixing drum 12 as well as in the vicinity of the end walls 11. The opening 20 extends over the entire mixing region 15 and can be sealed by the door 16 in a dust-tight manner. The door 16 is bordered by the second edge 19 which likewise extends in a plane and which seats on the first edge 18 when the door 16 is closed.

15. Claims 1, 2, 5, 6, 12, 15, 17, 18, 19, 21, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Wei et al. (US 6,058,828).

The patent to Wei et al. discloses the recited mixing device in Figs. 1-4 namely a horizontal drum 101; conveying spiral mixing means 130 with oblique surfaces capable of moving material in the drum in the recited manners; spindle 131a coaxial to the drum; reinforcement rings 101c along the exterior of the drum; lower opening 104; the lower

opening 104 being of smaller dimension than the diameter of the drum; and end walls 105, 106.

More particularly, the patent to Wei et al. discloses in FIG. 1 a schematic perspective view of the continuous solid dish cooking system as constructed according to the present invention, wherein a saturated steam is used as the heating medium. As shown in FIG. 1, the continuous cooking system for solid daily dishes comprises a precooker 100, a crushing mechanism 200, a main cooker 300, a driving mechanism 400, a heating medium dispensing mechanism 500, a sensing control mechanism 600, a flavoring adding mechanism 700, and a base 800 for supporting all the above mentioned components.

As shown in FIG. 2, the cooker 100 in the continuous cooking system for solid daily dishes 1 of the present invention comprises a cooking drum 101 in the shape of an elongated drum and a conveying-mixing-heating mechanism 130. The cooking drum 101 is comprised removably with an upper and a lower circular grooved casings 101a, 101b, with a sealing formed therebetween by means of a sealing strip 110, and provided at suitable intervals with reinforcing ribs 101c, for reinforcement on the one hand and for securing the cooking drum 101 on the base 800 on the other hand. Both ends of the cooking drum 101 are sealed by an end cover plate 105, 106, respectively, through a sealing strip (not shown) placed in the groove 105a, 106a on the edge of the end cover plates. On one end of the cooking drum 101, the upper casing 101a is provided with a food inlet 103, and on the other end of the cooking drum 101, the lower casing 101b is provided with a food outlet 104. Next, a temperature well 410 is provided

on the lower portion of the lower casing 101b of the cooking drum 101, in which a thermometer is installed for sensing the temperature inside the cooking drum 101.

The conveying-mixing-heating mechanism 130 comprises a spindle 131 consisting of a first shaft 131a and a second shaft 131b; a succession of spiral-shaped fins 133 spiralling along the second shaft 131b of the spindle 131 and having the inner edge thereof secured to the outer surface of the second shaft 131b; a heating medium channel 135 for carrying a heating medium such as a saturated steam; and a transmission and steam distributing bearing seat 137 secured to the outer surface of the end cover plate 105 for receiving the incoming heating medium and transferring thereof to the heating medium channel 135, and serving as the bearing for the first shaft 131a, wherein the heating medium channel 135 further comprises a radially extending inlet 135a positioned on the first shaft 131a, a first passage 135b positioned inside the first shaft 131a, a second passage 135c positioned inside the second shaft 131b, and a plurality of radially extending outlet 135d positioned on the second shaft 131b.

The relationship between the first shaft 131a and the transmission and steam distributing bearing seat 137 is shown in detail in FIG. 3. As shown in FIG. 3, one end of the first shaft 131a is positioned on the inside of the end cover plate 105 and has a tapered holder 131c which comprises a groove 131d for installing a ring washer (not shown), and an outer hexagonal retaining stud 131e axially projected from the end thereof. The other end of the first shaft 131a has a key slot 131f for engaging a transmission gear (not shown) in combination with a key (not shown). The first passage 135b of the heating medium channel 135 is provided roughly in the axle center of the

first shaft 131a, and the inlet 135a thereof is radially penetrated out from the shaft body. This unitary member comprising the first shaft 131a and the first passage 135b can be referred to as the transmission and steam distributing shaft 130a.

The bearing seat 137 is secured to the end cover plate 105 by means of a sealing ring 138 and the threading holes 105b provided on the end cover plate 105, and is provided therein with a steam receiving port 137a, a radial passage 137b, and an inner annular groove 137c communicating with the inlet 135a of the heating medium channel 135. Moreover, a leak proof construction consisting of a sealing ring 137d and a protective ring 137e is provided by the side of the inner annular groove 137c such that when the first shaft 131a rotates in the transmission and steam distributing bearing seat 137, the steam passing therethrough will not leak out.

Next, turning to FIG. 2, as shown, the end cover plate 106 has a recess 106b for carrying a centering axle 108, the centering axle 108, being similar to the supporting seat 131c of the first shaft 131a, having a tapered face 108a and an outer hexagonal stud 108b of specified length. In addition, both ends of the second shaft 131b have recesses 131g, 131h for the centering axle 108 and the supporting seat 131c to be inserted and mating in shape therewith.

With the above configuration, the second shaft 131b will be rotated by being removably driven by the first shaft 131a. After the second shaft 131b is assembled to the first shaft 131a, the steam entering the first passage 135b of the first shaft 131a can be transmitted in a leak proof manner to the second passage 135c extending at the axial center of the second shaft 131b, and then ejected into the cooking drum 101 from

the plurality of outlets 135d communicating with the second passage 135c and serving as steam nozzles. By means of the spiral-shaped fins 133 secured on the second shaft 131b, when the second shaft 131b rotates, the foods entering the food inlet 103 at one end of the cooking drum 101 are spirally advanced to the other end while being heated, and delivered out from the outlet 104 at the other end. At the same time when being spirally advanced, the foods are turned over, which substantially equals being stirred. As a result, the unitary member consisting of the second shaft 131b and the spiral-shaped fins 133 can be referred to as a conveying-mixing-heating spiral 130b, which, together with said transmission and steam distributing shaft 130a and the transmission and steam distributing bearing seat 137, is further combined into the so-called conveying-mixing heating mechanism 130.

16. Claims 1, 2, 17, 18, 19, 20, 22, 23, 24, 25, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Grier (US 1,168,799).

The patent to Grier discloses the recited mixing device in Figs. 1-6 namely a horizontal drum 10; conveying shovel type mixing means 45 with oblique surfaces capable of moving material in the drum in the recited manners; spindle 23 coaxial to the drum; and circular curved plate end walls 42.

17. Claims 1, 2, 3, 4, 8, 17, 18, 20, 22, 23, 25, 27, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Fischer et al. (US 3,685,805).

The patent to Fischer et al. discloses the recited mixing device in Figs. 1-4a namely a horizontal drum 14; conveying shovel type mixing means 80, 82, 86 capable of moving material in the drum in the recited manners; spindle 92 coaxial to the drum; the internal diameter of the drum 14 being greater than the internal length of the drum as seen in the Figures and as described below; access opening to the interior of the drum formed by removable end wall 38; and plate type end walls 38, 68 of circular cross section.

More particularly, the patent to Fischer et al. discloses a blender designated as 10 in FIGS. 1-3 and including a support assembly 12, which serves to mount a blending container 14 and associated drive 16; an agitating device 18 and associated drive 20; and a control console 22. Support assembly 12 is best shown in FIGS. 1, 2 and 3 as including a generally U-shaped stand 24 and an inverted generally U-shaped supporting bracket 26; the lapping leg portions of stand 24 and bracket 26 being pivotally connected by axially aligned pivot shafts 28 and 29. As will be apparent from viewing FIG. 3, bracket 26 may be manually rotated relative to stand 24 about a horizontal axis defined by pivot shafts 28 and 29 and be releasably, and frictionally locked in a desired position by operation of a knob 32, having a shaft, not shown, which is threadable into the stand and slideably received within an arcuate slot 34 provided in the bracket.

Blending container 14 is shown in the drawings as being in the form of an axially shallow, drum-like container having a main or body portion 36 and a removably mounted end portion or top 38. While containers having a diameter of about 6 inches and an axial thickness or depth of about 1 1/2 inches have been used with success, it is

anticipated that containers of varying dimensions may be employed providing that the diameter is maintained substantially larger than the axial length. Also, while top 38 is shown as including an annular flange portion 40 for the purpose of permitting the top to be slip-friction fitted onto body portion 36, it will be understood that any other suitable mounting or attaching arrangement may be employed. Preferably, all of container 14 is formed of a transparent plastic material, thereby to permit visual and/or photographic observation of blending phenomena occurring therewithin.

Container drive 16 is shown in FIGS. 1-4A as including a drive shaft 50, which is journaled within bearing supports 52 and 54; a shaft mounted pulley 56; an electric motor 58 including a drive pulley 60; and a flexible drive 62 for drivingly connecting pulleys 56 and 60. Bearing supports 52 and 54, as well as motor 58, are rigidly affixed for movement with supporting bracket connecting plate portion 26'.

Drive shaft 50 is suitably fixed to container 14, as by the provision of a set screw 64 carried by a mounted hub 66, which is in turn suitably affixed, as by adhesive bonding, to container body end portion 68. Both hub 66 and end portion 68 are shown in FIG. 4A as being provided with an axially extending stepped through bore opening 70 for the purpose of accommodating blending-treating attachments to be hereinafter described and associated shaft sealing glands 72. However, it will be understood that only hub 66 need be provided with a bore opening to accommodate drive shaft 50, when none of the several attachments are to be employed during any particular blending experiment.

The agitating device 18 includes a pair of plate portions 80 and 82, which are clampingly secured together by bolt fastener devices 84, the latter, if desired, additionally serving to mount generally L-shaped agitating blades or fingers 86. Agitating device 18 may also be employed as a liquid dispersion head. To this end, plates 80 and 82 cooperate to define a liquid reservoir or cavity 88, and suitable spacers, not shown, are arranged between abutting surfaces of the plates so as to define an annularly extending liquid discharge slot 90. As will be apparent, the amount of liquid discharged radially through slot 90 will depend primarily upon the width of the slot and the rotational speed of device 18.

Desired rotations may be imparted to device 18 by drive 20, which includes a hollow drive shaft 92, suitably affixed to plate portion 82 and supported concentrically within container drive shaft 50 by sleeve bearing 94; a shaft mounted pulley 96; an electric motor 98 having a drive pulley 100; and a flexible drive belt 102 for drivingly connecting pulleys 96 and 100. Motor 98 is, as best shown in FIG. 1, fixedly carried beneath connecting plate portion 26'.

It will be understood that the direction of rotation of device 18 and/or its speed of rotation relative to container 14 may be varied depending upon the blending experiment being performed. To this end, control console 22 is provided with knobs 104 and 106 for the purpose of adjustably controlling energization of motors 98 and 58, respectively.

Liquid to be dispersed within container 14 by operation of device 18 may be fed through drive shaft 92. However, in that such an arrangement would require the provision of a rotary union, it is preferable to provide a stationary liquid feed tube 108,

which is arranged concentrically within drive shaft 92 and fluid sealed relative thereto by suitable shaft seal devices, not shown. When employing this latter construction, a flexible tube, also not shown, would be attached to the outwardly extending end of tube 104 in order to facilitate pivotal movements of bracket 26 relative to stand 24.

In the construction thus far described, material may be loaded into or unloaded from container 14 by rotating bracket 26 to position the container in its phantom line position shown in FIG. 3, and removing top 40. In this position, the rotational axes of container 14 and drive shaft 50 are in alignment and substantially vertically disposed. Since container 14 is axially shallow and the removal of top 40 completely exposes the full cross-section of the blending chamber, different materials to be blended may be accurately positioned within the chamber as desired. For example, materials may be placed in layers for the purpose of examining axial blending phenomena, that is, movement or migrations of materials axially of the blending chamber; and/or in different radial quadrants of the chamber for the purpose of examining the radial blending phenomena, that is, movements or migrations of materials radially of the blending chamber. Further, the configuration of container 14 permits samples to be taken from any part of the cross-section or depth of the body of the blended material without the necessity of disturbing or causing intermingling of adjacent areas of such body.

The degree to which the blending chamber is filled will of course permit observation of re-cycling efficiencies, that is, the improvement in blending time as the amount of material within the blending chamber is reduced towards about 50 percent of capacity.

In the normal blending position of container 14, that is, the position in which theoretically, ideal radial, axial and recycling blending phenomena can be observed, the axes of rotation of the blending container and its drive shaft are substantially horizontal, as shown in full line in FIG. 3.

FIG. 4B illustrates a blending container construction, which is adapted to maximize axial blending efficiency. In this arrangement, the axis of blending container 14 is arranged at an acute angle relative to the rotational axis of drive shaft 50, such angle corresponding to substantially one-half of the acute angle .alpha. , which is formed by one of the container end portions, such as cover 38, and a line 109 drawn diagonally between corners of a rectangle formed by taking an axially extending sectional view of the blending chamber, such as is viewed in FIG. 4B. The mounting of blending container 14 in this manner may be achieved by forming the forwardly facing surface of hub 66, such that it lies within a plane making an angle of .alpha./2 with the rotational axis drive shaft 50. While the constructions illustrated in FIGS. 4A and 4B require that two separate blending containers be provided, it will be apparent that only a single container need be employed if hub 66 were to be formed with a pair of cooperating cam or wedge plates, which are relatively rotatable about the axis of drive shaft 50 for the purpose of varying the inclination of the axis of container 14 relative thereto.

FIG. 4C shows a gas treating device 110, which may be employed in place of agitating device 18. Device 110 includes a pair of plate portions 112 and 114, which are clampingly secured together by screw devices 116, and cooperate to form an open

ended cavity 118. Cavity 118 may be closed by screen plate 120, which additionally serves to support a tube 122 arranged concentrically inwardly of device mounting shaft 124. In the arrangement shown, a treating gas or air may be introduced into container 14 via tube 122 and such gases and/or vapors subsequently exhausted through screen plate 120 and a passageway 126 defined by tube 122 and shaft 124. As will be apparent, shaft 124 may or may not be rotated depending upon the treating process to be performed. Plate portions 112 and 114 are shown as being smoothly contoured in order to subject the material to be blended to minimum perturbations. However, it will be understood that, if desired, material agitations may be maximized during a gas treating operation by employing agitating blades of the type discussed with reference to device 18 and providing for powered rotations of shaft 124.

If it is desired to observe blending phenomena without the use of devices 18 and 110, the latter may be removed by first removing pulley 96 and top 38 and thereafter pulling device 18 or 110 and its shaft 92 or 124 outwardly through the blending chamber. If desired, the blending chamber may be rendered air tight by replacing one of seals 72 with a non-apertured disc or the like.

While the present invention has been described with particular reference to its use in demonstrating various blending phenomena or conducting laboratory experiments, it will be understood that it may be employed in commercial blending operations by merely scaling-up the blending container and the associated elements heretofore described. In this respect, experiments with a laboratory sized unit indicated that vastly improved axial blending efficiencies may be achieved as compared to

present commercial apparatus by utilizing an axially shallow blending container tilted in the manner suggested in FIG. 4B.

18. Claims 1, 2, 8, 12, 15, 16, 17, 18, 19, 21, 22, 24, 25, 26, 27, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Gergely (US 3,946,996).

The patent to Gergely '996 discloses the recited mixing device in Figs. 1-3 namely a horizontal drum 1; conveying spiral mixing means 130 with oblique surfaces capable of moving material in the drum in the recited manners; spindle 2 coaxial to the drum; access opening 11; lower opening 15; the lower opening 15 being of smaller dimension than the diameter of the drum and being of variable cross section via plate means 35; end walls of circular cross section, outwardly conical shape, curved plate shape , or dished head shape as clearly seen in Figs. 1 and 3; the transition of the inner wall of the drum 1 to the end walls extending within the recited range as seen in Figs. 1 and 3.

More particularly, the patent to Gergely '996 discloses in FIG. 1, a cylindrical drum 1 has a rotatable shaft 2 on its longitudinal axis, the shaft carrying a plurality of helical blades 3a to 3d fastened thereto such that both the shaft and the attached blades are rotatably driven by the motor 4 mounted on the left end of the non-rotatable drum 1. This motor 4 is easily designed so as to be driven in either of its two directions of rotation, i.e. as in any conventional reversible drive motor, preferably also with means for adjusting the speed of the motor (not shown).

The drum 1 is pivotally, i.e. tiltably, supported around the pivot axis 5 at the upper end of the base frame 6 or other suitable mounting means, the drum being shown in a normal horizontal position from which it can be adjustably titled or tipped such that the drum axis and the corresponding axis of shaft 2 always remain in approximately the same vertical plane. In order to obtain a desired angle of tilt or inclination of the drum for any individual operation, one can employ a suitably connected drive means or adjusting assembly 7, for example including a reversible drive motor 7a which operates a worm-gear spindle 7b pivoted at its top end to the lever arm 7c which in turn is fastened to or integral with the arcuate drum member 1a turning on the axis 5. The vertical reciprocal direction of movement of the spindle 7b thereby tilts the drum either to the left or to the right, preferably by not more than about 20 degrees. from the horizontal position of the drum axis.

The drum 1 is preferably constructed with a double wall 8a and 8b with the outer wall 8a being insulated. The intermediate space 9 between the walls can be fed by means of conduit openings 10 with a heating agent such as hot air, steam or hot liquids. The drum itself has a large feed opening 11 which can be sealed off by the cap 11a. An outlet opening 15 at the right lower end of the drum is used to remove material from the drum. By means of a vacuum connection 12, the contents of the drum can be placed under a vacuum. A filter device 13 is used to prevent dust or powdery material from being drawn out of the drum into the vacuum line 12. The outlet opening 15 is provided with a suitable flange 23 which permits the attachment of a closing plate or other auxiliary devices. As shown in FIG. 1, a screening and discharge device 16 is attached

onto the outlet opening 15 by means of flange 23 and fastening bolts 24. This discharge device 16 comprises a tubular or cylindrical housing 17 in which there is concentrically positioned a cylindrical screen 18 of smaller diameter, a discharge conduit or line 19 being attached to the lower side of the housing 17. The curved plate members 20, which are fastened onto shaft 21 and rotatably driven by motor 22, act to press the treated solid material outwardly through the screen 18. In this embodiment of the invention, the individual plates or half-plates 20 are constructed such that they first extend radially outwardly from the shaft 21 and then curve toward the screen circumference in the direction opposite to the direction of rotation of the shaft (see FIG. 2). The motor 22 is preferably a variable speed motor so as to drive the shaft 21 and plates 20 at an optimum speed or discharge rate.

The screening and discharge means 16 are thus easily mounted over a discharge opening at one end of the drum 1, preferably at the opposite end away from the drive means for mixing, stirring and conveying solid particles in the drum. The tubular housing 17 of this discharge means is preferably located so that its lowermost wall line together with the lowermost wall line of the cylindrical drum 1 form an angle .alpha. of not more than 20 degrees. (see also FIG. 3). The advantage of this construction resides in the fact that a completely free fall and the disintegration or dusting of the material can be avoided. Moreover, this discharge device is also constructed and mounted such that the mixing action in the drum need not be interrupted during the screening and discharge of the solid particles. In this manner, one

can achieve a sized granulate which exhibits little or no dusting, particularly so as to avoid contaminating the working area or surrounding environment with dust.

Through the appropriate choice of the conveying direction of the helical blade means 3 and the direction of inclination of the drum 1, it becomes possible to have the blade conveying effect operate either along with or opposite to the conveying effect produced by the force of gravity. This offers a wide variety of mixing, kneading, stirring and agitating conditions to be produced in the drum and on the substances contained therein.

In the horizontal position of the drum, it is especially possible to achieve a protected mixing which permits the filling of the drum, the mixing and the drying of the mixture or the granulate under vacuum conditions. By tilting the drum to the right, i.e. clockwise as shown in FIGS. 1 and 3, while simultaneously rotating the helical blade means 3 for conveyance to the right, the solid particles are pressed with greater friction against each other and against the walls. This position and operation of the drum is especially suitable for the compaction procedure in the so-called granulation of a finely divided or powdery solid material. This position also is quite useful for doping the mixture with small amounts of active agents, e.g. where a finely divided solid carrier is doped with a biologically active substance. For this doping or coating step, the active substance is preferably dissolved in a solvent and then sucked into the drum under vacuum through a line or conduit connected to the discharge opening 15. In this manner, the solvent penetrates the solid particles located before the opening 15 and is thoroughly mixed with these particles while being simultaneously evaporated, for

example with hot air and/or indirect heating through the drum walls. Thereby, there is the highest statistical certainty that the active substance is uniformly distributed on the carrier particles.

By tilting the drum 1 to the left, i.e. counterclockwise as shown in FIGS. 1 and 3, while possibly providing a conveyance by the helical blades 3 to the left at the same time, the discharge device 16 or the outlet opening 15 can be emptied or exposed such that suitable screening and discharge devices as described herein or other apparatus can be exchanged or installed on the drum. Thus, it is unnecessary to stop the mixing or stirring of the solid particles in the drum when making any exchange of equipment or parts at the outlet opening 15. Moreover, in this left-tilted position, a drying operation or even the discharge procedure can be advantageously initiated. In the discharge procedure, the treated particulate solid material in the form of a granulate or the like is agitated, screened and discharged by gradually tilting the drum from the left-tilted position back into the horizontal position and then slowly conveying the solids to the right while steadily continuing the mixing, screening and discharging steps. In this manner, one can avoid a disintegration or dissociation of the granules which have been carefully formed, e.g. as in a preceding compaction-granulation operation.

Yet another use of this apparatus arises especially if the helical blade means is to be operated with a conveying direction opposed to the gravity flow of the solid particles. Thus, an intensive air intermixing can be carried out during such conveyance so that a better drying effect is achieved.

After completion of a drying step or any previous treatment of the particulated solid material in the drum up to the point of discharge, one can achieve the best screening or sizing of the final product by maintaining the drum with its axis in an approximately horizontal position or tilted slightly to the left up to about 20 degrees., i.e. so that the discharge device 16 has its axis as represented by shaft 21 tilted by about 20 degrees. to the right as shown in FIGS. 1 and 3 up to an approximately horizontal position. The cylindrical screen 18 is preferably only partly filled at any given time with solid particles so that the blades 20 rotating with a brushing movement around the screen circumference do not need to overcome the resistance of a completely filled cylindrical screen. In general, the rate of discharge can be easily regulated together with the rate of conveyance from the drum 1 into the discharge device 16 so as to provide a careful screening or sizing operation. Individual screens 18 of different mesh sizes or different types of screen construction can be readily interchanged in the tubular housing 18. Also, it will be apparent that the discharge conduit 19 can be designed to avoid any dead spaces in the discharge device, e.g. by having a funnel shape or at least being located at the outermost or lowermost point of the housing 18 as indicated by the phantom lines 19a in FIG. 1.

With reference to FIG. 2, the rotating shaft carries at least one radial plate 20 as a wiping means passing circumferentially along the inner wall of the cylindrical sieve or screen 18, this plate or wiping means preferably extending axially over the entire length of the screen. These one or more plate wipers are best constructed so as to extend radially and arcuately outwardly to within very close proximity or in slight brushing

contact with the inner screen wall, i.e. the ends or tips of the plate being offset in the circumferential direction of the screen wall opposite to the direction in which the shaft 21 turns (as indicated by the arrow of rotation of the shaft and wiping plates in FIG. 2). Other plate or wiping means may also be used for specific purposes, and while such wiping means can be interchangeably fastened to the shaft 21, it is preferable to permanently fasten the plates 20 or the like to the shaft 21 and to interchange an entire unit consisting essentially of the housing, cylindrical screen, shaft and wiping means. The discharge nozzle, conduit or opening 19 may also be adapted to specific discharge operations, i.e. to conform to the material being discharged.

In FIG. 3, there is schematically illustrated a combination of apparatus for carrying out a complete drying procedure or drying stage. The drum 1 with a single helical blade 3' in this instance is provided with hot air circulation through the connecting lines 12 and 30, the latter being connected over a modified screening device 31 to the discharge opening 15 of the drum 1. The circulated air is drawn off from the drum 1 through line 12 and is heated in a conventional heat exchanger 25, e.g. by indirect heat exchange with steam or another fluid heat exchange medium. The withdrawal of the air and its circulation is accomplished by means of the centrifugal blower 26, the air being passed by this blower into a drying chamber 27 which can be filled with any suitable drying medium 28 through which the air can pass for removal of moisture, vaporous solvent or the like. Evaporated gases or solvent vapors are preferably removed directly from the drum 1 by a suitable bleed line 12' and/or a condenser and gas/liquid separator (not shown) in line 12 between the filter 13 and the heat exchanger 25. From the drying

chamber 27, the air is then blown through a sieve device 29 to recover any dust or similar entrained particles. On the other hand, where there is little or practically no entrained solids, the unit 29 can be a conventional liquid and vapor separator, e.g. to separate condensed solvent and/or other liquids through line 29a.

Before being reintroduced into the drum, the air can again be further heated in another heat exchanger 32. The air then passes through the feed line 33 over the line connection 30 and screening device 31 through the opening 15 into the finely divided or pulverulent solid material maintained within the drum by the screening device 31. The mixture of finely divided solids is strongly agitated and thoroughly dried by the hot air stream on the one hand and by the mixing and conveying action of the helical blade 3' on the other hand.

The screening device 31 of FIG. 3 preferably consists of a very fine mesh filter fabric, a sinter filter or a fleece-type filter. Such filters cause a broad, uniform distribution of the air stream and the formation of a turbulent bed or so-called fluidized layer of the finely divided mixture of particulate solids. This joint application of an air stream together with the through mixing produced by the gravity flow of solid material and the simultaneous conveying action of the helical blade guarantees the quickest possible drying according to the so-called air-suspension principle.

The drum 1 can also be heated for the drying procedure by passing a heating fluid through one inlet conduit 10 into the wall space between the outer insulated wall 8a and an inner heat-conducting wall 8b, and withdrawing the heating fluid through the other conduit 10 where necessary. As shown in FIG. 3, the inlet and outlet pipes 10' for

the heating medium can be located at diagonally opposite positions at the top and bottom lines of the drum, respectively. This is especially desirable to provide a relatively uniform heating within the drum itself while substantially reducing the extent to which the circulated air must be preheated outside of the drum. Whether heated or not, this inner wall 8b is preferably composed of a non-rusting and corrosion resistant material, especially a polished material such as stainless steel or a suitable alloy.

In still another variation, at least a portion of the inner drum wall 8b along the bottom surface of the drum 1 can be constructed as a porous screen or filter, e.g. a sinter filter or a finely perforated metal plate or the like, so that hot air can be introduced over the entire bottom surface below the bed or layer of finely divided solids, thereby providing a very uniform drying effect with continuous mixing also with the helical blade 3'.

Not only does the drum mixer and granulater of the invention ensure carefully controlled reproducible process conditions in the treatment and production of various powders and granulates but it also keeps the powdery or granulated material from coming into contact with the outer environment and avoids any necessity of transport or conveyance outside of the drum in going from step to step or stage to stage of a mixing and granulating process. The combination of elements in this apparatus thus provides a very effective and versatile piece of equipment for handling finely divided solids during all stages of mixing, stirring, conveying, drying, screening and the like. At the same time, there is a great reduction in cost where all such steps are to be carried out in a

single drum which is in itself relatively simple and inexpensive in construction and operation.

19. Claims 1, 2, 7, 8, 12, 15, 17, 18, 19, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Gergely (US 4,560,282).

The patent to Gergely '282 discloses the recited mixing device in Figs. 1-2 namely a horizontal drum 10; conveying spiral mixing means 13, 14 with oblique surfaces capable of moving material in the drum in the recited manners; spindle 11 coaxial to the drum; hinged large access opening formed when end wall 18 is moved away from the opening; lower opening 28; the lower opening 28 being of smaller dimension than the diameter of the drum; end walls 15 and 18 of circular cross section, outwardly conical shape, curved plate shape , or dished head shape as clearly seen in Fig. 1; the transition of the inner wall of the drum 10 to the end walls 15 and 18 extending within the recited range as seen in Fig. 1; end wall 18 being movable to a position for sealing the drum and contacting the mixing means 14 (Fig. 1) and a position moved away from the drum and the mixing means 14 (col. 2, lines 31-33); end wall 15 being connected to the mixing means 13, 14 and the other end wall 8 being movable.

More particularly, the patent to Gergely '282 discloses in FIG. 1, a drum 10 is rotatably hinged on an oscillating axis 12, being supported by a supporting frame 30. A rotary shaft 11 extending into a drum axis 46 is activated by a motor provided at 14. The details of these types of drums, such as their double walling and the furnishing of

mixing-, stirring- and screw-conveyors 13 on the shaft 11 are known to the expert; they may, for instance, be taken from U.S. Pat. No. 3,946,996. The cylindrical drum 10 can be oscillated around the horizontally extending axis 12 by means of the swivel drive 32. A lid 18 hinged at 20 on the drum provides access to the drum for cleaning and repair purposes. In the example of the embodiment shown in FIG. 1, lid 18 is provided with a series of devices 22,24 for the feeding or discharging of the drum contents. The drum may be replenished with substance by means of a substance-inlet valve 22; this is preferably achieved through suctioning into the drum vacuum. The apparatus is provided with a connection 16 formed as a flange or the like for a vacuum-producing and controlling system, preferably at the upper end of drum 10 that lies opposite lid 18, which need not be described here in more detail.

A flange 48, provided at the lower end of lid 18, serves as a disk valve seat, onto which the sifting device 26 with a sieve 56 is flanged. FIG. 2 illustrates how the sifting device 26 may be folded out from lid 18 by means of a hinge 62. In the flanged state, a sealing ring 54 provided in flange 50 of sifting device 26 presses against a sealing surface in the disk valve seat 48, locking the inside of the drum and the inside of the sifting device vacuum-tight against the outside atmosphere.

A disk valve 58 is provided in the inside of the sifting device 26 and is movable in the direction of sifting device axis 44. Disk valve 58 is provided with sealing ring 42 on its outer surface. If disk valve 58 is moved in the direction of drum 10 by means of a manually or mechanically operated crank drive 40, then the disk valve 58 comes to rest against the disk valve seat 48 and the interior of drum 10 is vacuum-tightly separated

from the interior of the sifting device 26 by means of the gasket 42 during granulation. The discharge device 60, rotating by means of a drive 38, is fully described in U.S. Pat. No. 3,946,996 (see section 18 above).

An outlet 28 for removal of the product is provided in a lower section of the sifting device 26. A valve 34 is disposed at the end of outlet 28; a hose or a container for retrieval of the product may be fastened by flanging to its outlet flange 36.
These procedures according to the invention succeed in allowing the sifting device to remain fastened to the entire granulating apparatus and also make it possible to easily wash the entire equipment including the sifting apparatus. For this, for instance, valve 34 is shut and disk valve 58 is opened, so that drum and sifting device may be filled with water or other cleansing means. Thereafter, all components are started up and the equipment is cleansed. The apparatus according to the invention allows, for instance, pouring the contaminated cleanser into special containers, which might contain poisonous and extremely dangerous substances for instance. Considerable protection of service personnel is thereby obtained. In case the entire equipment has to be dried after the end of the cleansing process, valve 34 is simply closed in the apparatus of the invention, while disk valve 58 is open, and the entire equipment is evacuated by means of a vacuum pump. In the upper region of the sifting device 26, an additional filler vent with a flange 52 is disposed, which, in the embodiment of FIG. 1, is short-circuited by hose 24 with valve 22. At normal operation, flange 52 is covered by a blind flange (not shown).

20. Claims 1, 2, 17, 18, 19, 21, 22, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by GB 2002645 A.

GB 2002645 A discloses the recited mixing device in Figs. 1-3 and 6-7 namely a horizontal drum 6; conveying spiral mixing means 61 with oblique surfaces capable of moving material in the drum in the recited manners; spindle 60 coaxial to the drum; and circular end walls 4b, 5.

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boltner-Brand et al. (US 6,179,462).

Boltner-Brand et al. (US 6,179,462) discloses the flat plate 29 with openings or holes 14, 30 but does not disclose the flat plate being detachable from the drum or the holes being of different sized diameters.

Regarding the flat plate being detachable from the drum, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the flat plate in Boltner-Brand et al. to be detachable from the drum, since

it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Regarding the sizes of the openings or holes in the flat plate, since it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.,* 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984). Accordingly, the examiner believes that to have formed the openings or holes in the flat plate of different sized diameters would not perform differently than the prior art device, so the instant the claimed device is not patentably distinct from the prior art device of Boltner-Brand et al.

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E. Cooley whose telephone number is (571) 272-1139. The examiner can normally be reached on Mon-Fri. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles E. Cooley
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Art Unit 1723

10 June 2005